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SOME MAMMALS OF YEMEN AND THEIR ECTOPARASITES[1]

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INTRODUCTION

Late in 1950, His Majesty Imam Ahmad bin Yahya Hamid al-din, King of Yemen, invited Captain J. J. Sapero, M.C., U.S.N., Director of the United States Naval Medical Research Unit, Cairo, Egypt, to send a group of experts to make a brief medical survey of the Yemen for His Majesty's guidance in future disease control administration. The group, which became known as the United States Naval Medical Mission to the Yemen, was composed of Commander Robert A. Mount, epidemiologist; Lieutenant Commander Kenneth L. Knight, entomologist; Lieutenant Robert E. Kuntz, parasitologist; Mr. Harry Hoogstraal, medical zoologist; Hospital Corpsman Joseph R. Baranski, bacteriological technician; and Abdel Azis Salah Effendi, general technical assistant and interpreter. The specimens collected by the Mission were sent to Chicago Natural History Museum and were identified by the senior author.

In order to learn as much as possible about parasite-bearing mammals in the short period of six weeks, during which other professional and social duties had to be fulfilled, it was decided to specialize on the common species in or near populated areas. For this reason little or no attempt was made to secure rarities. The work began at Ta'izz, in an area representative of middle altitude flora and fauna, on January 7, 1951, and continued through January 24. The facilities and period for study in the Tá'izz region were the best

[1] Reports from the Medical Mission to Yemen, southwest Arabia, 1951.

encountered during the survey, and the collections from this region are probably the most broadly representative of any of those from the three altitudinal areas visited.

On January 25 and 26 the party drove down to the coastal desert lowlands (*Tihama*) and at Hodeida commenced operations which lasted till February 4. Although the Hodeida stay was short, and facilities for work were not equal to those of Ta'izz, the collections obtained in this area well represent the common fauna at this season.

On February 4 the party left Hodeida by jeep and climbed upward, via Bajil, 'Obal, and Hammam 'Ali, through rich lower middle altitude country that we heartily recommend to future biologists who study the natural history of the Yemen. On February 5 the expedition reached Ma'bar, at 7,400 feet elevation, and remained there until February 10. The rather barren Ma'bar plateau furnished some interesting material, and the fertile valleys and hills around it are of evident interest. The last highland station, reached in a few hours' drive from Ma'bar, was at San'a, 7,100 feet elevation, where the party remained till February 19, when it departed by plane. The Ma'bar and San'a collections provide a useful picture of the upland fauna, though field work at San'a was seriously curtailed.

All small mammals, except as otherwise noted, were either shot and placed in a bag to be examined for ectoparasites or were live-trapped and killed as quickly as possible afterwards, so that their parasites could be collected. The party had been erroneously advised not to take firearms to the Yemen and so was unable to collect many of the larger mammals. Thanks to the Crown Prince, Seif el Islam Albadr, the expedition was furnished with a Royal Guard, who provided some game with his gun.

The work in the Yemen was done during the height of the dry season. Hunting, trapping, and parasite infestation would probably be quite different during the rainy season.

For an excellent general account of the Yemen, with emphasis on the biological features, the reader is referred to Hugh Scott's *In the High Yemen* (1942, John Murray, London). The experiences of the U. S. Naval Medical Mission to the Yemen have been presented in the National Geographic Magazine (February, 1952). Geomedical observations made by the mission have been reported by Mount (1953).

Besides the mammals mentioned below, no others were seen except baboons, which were very common around Ta'izz. The party was told that none occurred in the coastal lowlands or in the high mountains around Ma'bar and San'a, and none were seen in these places. Hedgehogs were said to be common in the lowlands where the coastal lowlands meet the foothills, and in the foothills. The African Arabic word for mongoose never elicited a response of recognition. The Yemeni insist that the giraffe and lion exist in their hinterlands. Whether they now do is of course doubtful, but we would not be surprised to learn that the lion and giraffe were present there until recent times. One man in San'a insisted that a large, striped *nam'r* ("tiger") exists in the mountains to the east; he may have seen a picture in a book!

We are indebted to Dr. T. C. S. Morrison-Scott and to Mr. R. W. Hayman of the Mammal Department, British Museum (Natural History), for comparing the types in their care with our specimens of *Meriones* and *Gerbillus* and for advice regarding the identification of the gazelles.

NOTES ON PARASITES

Ectoparasites listed under individual hosts have been identified by the following persons: fleas, Lieutenant Colonel Robert Traub, Army Medical Service Graduate School, Washington, D.C.; mites, Dr. C. D. Radford, Manchester, England; ticks, Mr. Harry Hoogstraal; bat ticks, Professor O. Theodor, Hebrew University, Jerusalem. Identifications have not yet been received from specialists in the following groups: Streblidae, Polyctenidae, and Hippoboscidae.

Endoparasites from the mammals were collected by Dr. R. E. Kuntz, the mission's parasitologist. They have been submitted to the following specialists, who will report on their findings separately: Acanthocephala, Dr. Helen Ward, Department of Zoology, University of Tennessee; Cestoda and Nematoda, Dr. Thomas W. M. Cameron, Institute of Parasitology, MacDonald College, Canada; Trematoda, Dr. R. E. Kuntz, Naval Medical Research Unit No. 3, Cairo, Egypt; Hippoboscidae, Dr. J. C. Bequaert, Museum of Comparative Zoology.

The field notes have been planned with a view to emphasizing information which may be of value in future field studies of Yemen mammals and to presenting as clearly as possible the data that were obtained in a short period of time on the ectoparasitic infestations of Yemen mammals.

YEMENI ARABIC NAMES

	Singular	*Plural*	*Localities*
Bats (general)	*Ghafash*	*Ghawafish*	Ta'izz
Bats (general)	*Fakhadood*	*Fakhadid*	Hodeida
Long-eared Bat	*Khosafan*	*?*	San'a
Fruit Bat	*Zort*	*Azrat*	San'a
Rats and Mice	*Fahr*	*Feiran*	All
Rats, Mice, Shrews	*Ikbar*	*?*	Lowlands chiefly
Hyrax	*Waber**	*Obar*	All
Fox	*Tha'al*	*Athala*	All
Gazelle (male)	*Dthaby*	*Dthibya* or *Dthiba*	All
Gazelle (female)	*Dthabia*	*Dthabiat*	All
Hyena	*Arga*	*Diba'a*	All
Leopard	*Nam'r*	*Anmira* or *'Nmara*	All
Rat Trap	*Makfad*	*Makafid*	San'a and Hodeida
Rat Trap	*Meghinab*	*Mahaanib*	Ta'izz

* Literally, "camel hair."

In summarizing the host-ectoparasite data, the following facts stand out:

1. *Rattus rattus*, the black rat, is everywhere common in Yemen towns and cities, and a certain percentage in each area supports a heavy enough infestation of *Xenopsylla cheopis* to constitute a menace.

2. *Suncus sacer*, a shrew, which is very common in Hodeida, appears to be a flea and tick host of marginal importance.

3. *Mus musculus bactrianus*, the house mouse, which also lives under some field conditions and which is common in certain towns and cities, appears to be of some slight importance as a host of immature ticks but of no importance as a flea host.

4. The role of the ubiquitous field jird, *Meriones rex buryi*, should receive careful study.

5. The fox and the gazelle are, in our limited experience, of no little importance as hosts of potentially dangerous ticks. Foxes also harbor medically important fleas. Both mammals are locally common.

6. In the coastal desert, the common hare, *Lepus a. arabicus*, is an exceedingly important host of immature ticks, and a related upland subspecies should be similarly considered. The little desert gerbil, *Gerbillus cheesmani maritimus*, is also to be dealt with in relation to immature ticks (*Hyalomma ?dromedarii*). Upland gerbils should be considered in relation to *X. cheopis*.

7. The spiny mouse, *Acomys dimidiatus homericus,* harbors a tick (*Haemaphysalis* sp.) which may possibly have some relation to rickettsial disease.

8. The habits and frequency of the grass rat, *Arvicanthis niloticus naso,* should be studied and its ectoparasites should be carefully investigated. A probably uncommon rodent, *Myomys fumatus yemeni,* should receive some attention as a flea host.

9. The presence of the mite, *Dermanyssus muris* Hirst 1913, and of six new species of tromiculid mites from *Rattus* and other mammals in this collection points to a source of potential disease vectors.

ANNOTATED LIST

Suncus murinus sacer Ehrenberg

Suncus sacer Ehrenberg, 1833, *in* Hemprich and Ehrenberg, Symb. Phys., Mamm., dec. 2, folio k—Suez, Egypt.

Specimens examined.—Total 10. Hodeida, 1 male, 9 females.

The names *sacer* and *crassicaudus* Hemprich and Ehrenberg have been listed under various dates by Cabrera (1925), G. M. Allen (1939), and others. We follow the latest revision by Ellerman and Morrison-Scott (1951).

Measurements.—Total length 175–211 mm., tail 59–76; hind foot 21–22; ear 15–16. Skull: greatest length 29.4–30.4; condylo-basal length 28.0–29.3; palatal length 13.4–13.9; least width of waist 5.3–5.7; greatest width 11.5–12.5; tooth row 12.5–13.4; greatest width across outside of molars 8.9–9.0.

Field notes.—These shrews are exceedingly common in the crowded bazaars and do not appear to fear the presence of man. They dash about at the bases of walls, partitions, and boxes at any time of day or night in spite of considerable human activity all around them. Dozens could have been taken with little effort and many more were obtained than were preserved. We saw no shrews in houses or buildings outside the city bazaar. The Yemeni claim that onions are the best bait for shrews, and we succeeded in trapping specimens with onions as well as with bread, oatmeal and peanut butter, meat, banana, and potatoes. It appears that some shrews may have happened to stumble into the trap regardless of kind of bait. Domestic shrews probably do not occur anywhere in the Yemen above the coastal plain.

The ectoparasites listed below were the only ones found on about twenty-five shrews examined. We may guess from the paucity of parasites that these common insectivores are not of considerable medical importance in Hodeida, but the presence of two fleas, *Xenopsylla cheopis*, on them is a warning that shrews must not be entirely overlooked in a medical survey.

Ectoparasites.—Ticks: *Rhipicephalus s. sanguineus.* Fleas: *Xenopsylla cheopis.*

Eidolon sabaeum Andersen

Pterocyon sabaeus Andersen, 1907, Ann. Mag. Nat. Hist., (7), **19:** 505—Lahij, Aden.

Eidolon sabaeum Hayman, 1941, Exped. S. W. Arabia, Brit. Mus. (Nat. Hist.), **1:** 1—San'a, Yemen.

Specimens examined.—Ta'izz (4,100 feet), 1 male.

This is the third record of this bat and the second record for Yemen.

Measurements.—Forearm 118.5 mm.

Field notes.—We were told that this was the wrong season to find fruit bats. We all kept a sharp lookout for them in flight at dusk and at night, but saw none. The single specimen was found hanging alone in a fruitless tree in town early one morning.

Ectoparasites.—Mites: *Ancystropus lateralis* (Ta'izz). Bat ticks: *Cyclopodia greeffi arabica* (Ta'izz).

Nycteris capensis damarensis Peters

Nycteris damarensis Peters, 1870, Monatsber. Akad. Wiss. Berlin, **1870:** 905, fig. 7 (lower teeth)—Otjimbingue, Damaraland, Southwest Africa.

Specimens examined.—Total 28. Al 'Asr (7,100–7,200 feet; 3 miles west of San'a), 12 males, 16 females.

Measurements.—The forearms of this series range from 43.6 to 48.5 mm. The total length and the length of the upper tooth row in the two skulls do not correspond with measurements given for *brockmani* from Eritrea, British Somaliland, and Kenya or *media* from Harar, Abyssinia, so the older name is used. *N. damarensis* has previously been known from Tanganyika to Angola and south.

Field notes.—As soon as we inquired about bats at Al 'Asr, the crowd about us dispersed and returned in a few minutes with many of these bats, all of which, we were told, had been hanging in dark first-floor stable rooms of houses.

Hipposideros caffer caffer Sundevall

Rhinolophus caffer Sundevall, 1846, Ofvers. Kongl. Svenska Vet.-Akad. Förhandl. Stockholm, 3, no. 4, p. 118—near Port Natal, Natal; Hayman, 1941, Exped. S. W. Arabia, Brit. Mus. (Nat. Hist.), 1: 2—Jebel Harir, 5,200 feet, West Aden Protectorate.

Specimens examined.—Total 2. Raudha (7,100 feet; 3 miles north of San'a), 1 male; Al 'Asr (3 miles west of San'a), 1 male.

Measurements.—Forearm 47.5 and 48.0 mm.

Field notes.—These two bats were each hanging alone in trees, the Raudha specimen in a *mish-mish* ("apricot") tree and the Al 'Asr specimen in an acacia tree.

Ectoparasites.—*Nycteribia integra* (Raudha).

Rhinolophus clivosus acrotis Heuglin

Rhinolophus acrotis Heuglin, 1861, N. Act. Acad. Caes. Leop.-Car., 29: 10—Keren, Eritrea; Hayman, 1950, Ann. Mag. Nat. Hist., (12), 3: 417—Ta'izz, Yemen.

Specimens examined.—Total 26. Ta'izz (4,100 feet), 7 males, 18 females; Al 'Asr (7,100 feet; 3 miles west of San'a), 1 male.

This species preferred buildings, while the next species, *blasii*, was found only in caves.

Measurements.—Forearms 47.3–52.8 mm.

Field notes.—All of these bats were taken in the dark first-floor stable rooms or upper-story storage rooms of houses in town, where they hung singly or in twos or threes in corners near the ceiling.

Ectoparasites.—Mites: *Trombicula knighti, T. filamentosa, T. brevitarsa, Brennanella longispina, Labidocarpus nasicolus* (Ta'izz). Bat ticks: *Nycteribia integra* (Al 'Asr and Ta'izz).

Rhinolophus blasii Peters

Rhinolophus blasii Peters, 1867, Monatsber. Akad. Wiss. Berlin, 1866: 17—southeastern Europe.

Specimens examined.—Total 100. Wadi Mal-el-Ghail (6,500 feet; 8 miles west of Ma'bar), 1 female; Al 'Asr (7,200 feet; 3 miles west of San'a), 41 males, 58 females.

The type locality of *R. blasii* is southeastern Europe. It has been recorded from Greece by Miller (1912) and from Transcaspia by Ognev (1927). Specimens have been examined from Montenegro, Cyprus, Syria, and Palestine. It is not a common bat in museum

collections. These specimens were taken in February and may represent a wintering colony.

The Yemen series is lighter in color than five from Cyprus, the dorsal hairs being tipped with brown while those from Cyprus are dark gray. The one skull measured is the maximum for the species.

Measurements.—Miller found that the forearm in five specimens ranged from 44.6 to 47.0 mm. The forearm in this series measures from 45.5 to 48.9 (males 45.5–47.6, females 45.9–48.9). Ten of the females have forearms of 48.0 mm. or over.

Field notes.—The Wadi Mal-el-Ghail specimen was taken in a very small, dark, damp cave from which a rivulet emerged. Around Al 'Asr are many rather small hillside caves, some of which harbor bats though similar ones lack them. As soon as we showed an interest in bats the village men scattered out over the countryside to investigate these caves, so that it was impossible for us to get an accurate idea of the distribution of bats in various caves.

Ectoparasites.—Fleas: *Rhinolophopsylla unipectinata* subsp.? (Al 'Asr). Bat ticks: *Penicillidia fulvida, Nycteribia integra* (Al 'Asr); *Nycteribia integra* (Ma'bar, Wadi Mal-el-Ghail).

Pipistrellus kuhlii kuhlii Kuhl

Vespertilio kuhlii Kuhl, 1819, Ann. Wetterau. Gesells. Naturk., 4: 199—Trieste (Italian-Yugoslavian border).

Specimens examined.—Total 4. Ma'bar (7,400 feet), 1 male; San'a (7,100 feet), 2 males, 1 female.

The color of the males is dark brown, red brown, and gray brown. The edges of the wings are white. They compare favorably with a large series from Iraq. The forearms measure 32.4 to 34.2 mm.

Field notes.—The Ma'bar specimen was knocked down by a man's hat which one of our party threw at it while it was flying at night around a blooming apricot tree in the rest-house garden. The San'a specimens were secured in a similar fashion as they coursed the city streets in their low, darting, somewhat cumbersome flight. They were common and noticeable in San'a, for they squeaked as they flew only ten or twelve feet above the ground in the crowded streets. They often frequented shops illuminated by kerosene pressure lanterns.

Chaerephon pumilus pumilus Cretzschmar

Dysopes pumilus Cretzschmar, 1826, Rüppell's Atlas, Reise Nord. Afrika, Säugeth., 1826: 69, pl. 27—Massawa, Eritrea.

Tadarida (Chaerephon) pumilus Hayman, 1950, Ann. Mag. Nat. Hist., (12), 3: 418—Sabiya, Yemen.

Specimens examined.—Total 7. Bajil (100 feet; near Hodeida), 6 males, 1 female.

This locality is a short distance south of Sabiya, from where Hayman (supra cit.) reported this species. The measurements of the forearms are 35.5–38.6 mm.

Field notes.—We captured these little bats during a noonday rest stop at the government house in Bajil, where we heard a faint squeaking from the veranda ceiling, about twenty-five feet away. The ceiling was constructed of parallel crisscross layers of small sticks overlaid by mud. Several bats that were seen peering from the interstices of the sticks were extricated with a hooked rod. A few were shot with the bat gun; others were taken by hand. Many more were present but were inaccessible.

Vulpes vulpes arabica Thomas

Vulpes vulpes arabica Thomas, 1902, Ann. Mag. Nat. Hist., (7), 10: 489—Muscat, Arabia.

Specimens examined.—Total 2. Ta'izz: Jebel Zarba (7,000 feet), 1 male; 2 miles east of Ma'bar (7,400 feet), 1 male.

These skins, collected in January and February, are in very worn, ragged pelage. In both specimens the throat, the chest, and a line down the center of the belly are black.

Measurements.—Total length 971–1,003 mm.; tail 406–420; hind foot 146–152; ear 102–108. Skull: greatest length 136.0–142.4; condylo-basal length 130.5–137.2; palatal length 68.3–70.5; interorbital width 22.5–25.6; intertemporal width 16.3–19.8; zygomatic width 70.8–74.3; width of brain case 44.0–46.1; upper tooth row 59.4–62.8; width across canines 20.0–23.5, across molars 37.0–40.5.

Field notes.—Foxes were very common around Ta'izz, but though we shot at a number of them at night, none were obtained. Our guard obtained the Jebel Zarba specimen early one morning. On the flat plain around Ma'bar, foxes could be seen running at any hour of the day or night. Their dens often opened into ditches or mounds at field edges, or were dug in the field. The single Ma'bar specimen was trapped in a flat, fallow field at a crater about two feet deep and with a radius of some ten feet. Six holes opened into the sides of this crater and at least three foxes inhabited the site. If the two specimens which we obtained are a real indication, it would appear

that foxes in the Yemen are rather important hosts of species of fleas and ticks of economic importance.

Ectoparasites.—Ticks: *Amblyomma* sp. (probably *variegatum*), *Haemaphysalis leachi humerosoides, H. leachi indica, Hyalomma* sp., *Rhipicephalus sanguineus sanguineus* (Ta'izz: Jebel Zarba); *R. s. sanguineus* (2 miles east of Ma'bar). Fleas: *Ctenocephalides canis, Pulex irritans* (2 miles east of Ma'bar); *C. felis* (Ta'izz: Jebel Zarba).

Felis pardus nimr Hemprich and Ehrenberg

Felis nimr Hemprich and Ehrenberg, 1832, Symb. Phys., Mamm., dec. 2, folio gg, pl. 17—Arabia.

A complete leopard skin was purchased at Ma'bar and two at San'a, one without feet and the other lacking feet, head, and tail. These are supposed to have been killed in the regions where purchased.

The skins are all light-colored. The Ma'bar skin is the darkest and with hair at least twice the length of those in the San'a skins. Incomplete as they are, they are valuable because of their rarity. From published reports it appears that there are none in the British Museum.

Field notes.—From information we were able to secure, it appears that the leopard seldom if ever ranges into the coastal lowlands and is never common in the uplands, though almost every mountainous area is visited by them from time to time. The Beni Dubian specimen from the San'a area had been very recently killed in a pitfall after it had made off with stock. We were told that whenever there is news of a leopard in a populated area organized hunts either obtain the predator or drive it out of the district.

Hyaena hyaena sultana Pocock

Hyaena hyaena sultana Pocock, 1934, Ann. Mag. Nat. Hist., (10), **14**: 636—Mount Quara, 1,500 feet, Ain, southeastern Arabia.

One female from Hodeida is referred to this race.

Field notes.—This hyena had been trapped on the outskirts of the city some weeks earlier and kept alive. We saw no other hyenas in the Yemen, but in caves at Al 'Asr and Kariet Wadi Dhahr in the San'a region we found evidence of their presence.

Ectoparasites.—Ticks: *Rhipicephalus s. sanguineus.* Fleas: *Ctenocephalides felis.* Flies: 1 male, *Hippobosca longipennis.*

Lepus arabicus arabicus Ehrenberg

Lepus arabicus Ehrenberg, 1833, in Hemprich and Ehrenberg, Symb. Phys., Mamm., dec. 2, folio r *recto*—Qunfidha, Arabia.

Specimens examined.—El Hauban (in Wadi Maleh, about 5 miles east of Ta'izz; 3,900 feet), 1 male.

This specimen is dark gray with a broad black stripe down the center of the back. The nape is buffy-rufous. Underparts are white except the throat, which is buffy.

Measurements.—Total length 430 mm.; head and body 368; tail 62; hind foot 103; ear 98. Skull: greatest length 75.5; condylo-basal length 66.3; palatal length 26.9; interorbital width 12.9; zygomatic width 36.8; width of brain case 26.1; upper tooth row 12.4; length of nasals 30.1.

Field notes.—This hare, which was shot on a hill covered with euphorbia bush, was one of several we saw on night trips into the hills and valleys around the city of Ta'izz. At dawn we saw dozens of hares, which often raced parallel with our jeep for several hundred feet across fallow fields, but we failed to obtain specimens. Hares are probably important hosts of ticks in the Ta'izz area.

Ectoparasites.—Ticks: *Amblyomma* sp. (probably *variegatum*), *Hyalomma* sp., *Rhipicephalus s. sanguineus, Rhipicephalus e. evertsi.*

Lepus arabicus subsp.

Specimens examined.—Total 6. Hodeida (sea level), 5 males, 1 female.

None in this series has the black line on the back which marks the Ta'izz example of *arabicus*. They are all light-colored, two being light gray, two yellowish gray, and two light gray streaked and patched with light brownish red. The napes are light buff, the throats buffy and the remaining underparts white. They probably belong to one of the coastal races, *omanensis* or *syriacus* perhaps, but without comparative material they can not be definitely identified. All were taken between January 28 and 31.

Measurements.—Total length 395–455 mm.; head and body 338–396; tail 57–76; hind foot 91–104; ear 97–116. Skull: greatest length 72.5–79.5; condylo-basal length 63.2–70.5; palatal length 27.2–30.5; interorbital width 11.7–13.9; zygomatic width 35.4–37.6; width of brain case 23.5–24.2; upper tooth row 12.7–14.3; length of nasals 28.6–33.5.

Field notes.—All of these specimens were shot at night among sand hummocks in the scattered shrub desert around Hodeida, where hares are very common. Some were seen in the late afternoon and more at dusk, but after dark many more appeared. Two were seen at dusk jumping high and straight into the air while facing each other, resting a moment and sometimes turning or kicking or nudging.

The infestation of these hares with larval and nymphal *Hyalomma* ticks indicates that they are an important host for this genus of parasites, all species of which are of economic importance.

Ectoparasites.—Ticks: *Hyalomma* sp., *Rhipicephalus s. sanguineus.* Fleas: *Synosternus pallidus.*

Arvicanthis niloticus naso Pocock

Arvicanthis niloticus naso Pocock, 1934, Ann. Mag. Nat. Hist., (10), **14**: 636 (preliminary desc.); 1935, (10), **15**: 441—Lahej, near Aden, southern Arabia.

Specimens examined.—Total 6. Ta'izz area (4,000 feet; one mile north of Ta'izz), 1 female; El Hauban (in Wadi Maleh, 5 miles east of Ta'izz), 1 female (juv.); Wadi Maleh (7 miles east of Ta'izz), 1 male; Usaifira, 2 males, 1 female.

This race, differing from typical *niloticus* of Egypt by the greater amount of reddish hairs on the nose and around the eyes, was described from Lahej, Aden, and one specimen was recorded from El Kubar. The series from the Ta'izz area agrees closely with the original description of the color.

Field notes.—These specimens were trapped at what I believed to be *Psammomys* burrows (which yielded *Meriones rex buryi*, etc., only). Entrances of rare burrows which I believed to be characteristic of *Arvicanthis* always resulted in empty traps.

The first specimen was trapped in the late afternoon under a euphorbia bush on a hillside densely grown with these bushes. The El Hauban specimen came from a rock dike in a fallow field. Here we also took *Acomys dimidiatus homericus* and *Meriones rex buryi.* The Wadi Maleh specimen was taken at a termite mound in a dense acacia thicket beside a marshy seepage area in which we also collected *Acomys, Meriones, Gerbillus,* and *Mus.* The Usaifira specimens were trapped on runways in a dense shrubby thicket intermixed with euphorbia bushes and bordering the King's garden.

Ectoparasites.—Ticks: *Haemaphysalis leachi* subsp., *Rhipicephalus s. simus.* Fleas: *Pulex irritans, Ctenocephalides canis.*

Myomys fumatus yemeni subsp. nov.

Type.—Chicago Natural History Museum no. 77972, from Kariet Wadi Dhahr, six miles northwest of San'a. Altitude about 6,400 feet. Adult male, skin and skull. Collected February 13, 1951, by Harry Hoogstraal. Original number HH 6398.

Diagnosis.—Close to *M. f. brockmani* in color but larger.

Color of type.—Dorsal area between Clay Color and Tawny Olive; face in front of ears grayer; underparts pure white; hands and feet white; tail bicolor, but not heavily penciled.

Skull.—Like *M. f. brockmani* but larger.

Measurements (type).—Total length 290 mm.; tail 173; hind foot 28; ear 26. Skull (two topotypes in parentheses): greatest length 31.5 mm. (32.2–33.3); condylo-basal length 29.3 (29.9–31.0); palatal length 15.9 (15.6–16.8); interorbital width 4.4 (4.3–4.5); zygomatic width 15.9 (16.0–16.6); width of brain case 11.9 (11.3–11.6); length of bullae 5.8 (5.6–5.6); diastema 8.2 (8.5–9.0); length of palatal foramina 7.8 (7.5–8.0); length of nasals 11.5 (12.5–13.3); upper tooth row 5.8 (5.6–5.9).

Remarks.—While the number of mammae can not be checked, these have been considered to be *Myomys* on account of the long tail, much longer than head and body, and the pure white underparts. As this is the first record of the genus outside Africa, the possibility of these having been introduced was considered; however, *yemeni* is larger than other known *Myomys*. The specimens were "trapped in the King's garden under tamarisk tree." Two were obtained under different tamarisk trees and one came from the base of an acacia tree, all surrounded by shrubbery. The type is adult, with slightly worn teeth, and the topotypes are older with well-worn teeth but with incomplete tails.

Field notes.—Beside the mosque in the village of Wadi Dhahr is the King's walled garden, bordered by acacia and tamarisk trees, beneath which grass and dense shrubbery grow. This ground and the garden are laced with rodent runways leading to innumerable holes and to the bases of the trees. Some of the holes appeared so characteristic of *Thammomys* that I set many traps in the hope of obtaining this genus of rodents. Only three traps at tree bases caught specimens. The rodents' superficial appearance was so much like *Thammomys* that I felt certain at the time that they belonged to that genus. The two specimens with broken tails were caught in that condition. The presence of so many rodents in this garden

may lead to many injurious fights. Specimens of *Meriones rex buryi* were also taken on these runways.

Ectoparasites.—Fleas: *Xenopsylla cheopis.* Mites: *Laelaps nuttalli* (Kariet Wadi Dhahr).

Rattus rattus rattus Linnaeus

Mus rattus Linnaeus, 1758, Syst. Nat., ed. 10, 1: 61—Sweden.

Specimens examined.—Total 54. Hodeida (sea level), 9 males, 10 females; Ta'izz (4,000 feet), 11 males, 5 females; San'a (7,100 feet), 11 males, 8 females.

The series from Hodeida, with the exception of three, are dark-bellied and referable to *alexandrinus.* The ones from Ta'izz and San'a, and three from Hodeida have white bellies and might be called *frugivorus.*

Field notes.—In all the upland cities in which we stayed, except Ma'bar, domestic rats were very common in the usual locations—dwellings, storehouses, sheds, gardens, and stables. In Ma'bar we saw some signs of domestic rats, but they were not numerous, and we failed to obtain specimens. I hesitate to venture an explanation for the apparent paucity of *Rattus* in Ma'bar. The Yemeni are very rat-conscious and have many live traps of excellent Arabic design, but it appears that while their trapping activities may keep rats at a certain local population level, the city-wide infestations are very high.

Of particular interest in this ectoparasite series is (1) the absence of immature ticks; (2) the number of flea-free rats (in Ta'izz 12 out of 16 [75 per cent] were flea free; in San'a, 7 out of 16 [44 per cent] were flea free; in Kariet Wadi Dhahr, none out of 3 were flea free); and (3) the heavy infestation of medically important fleas on those rats that were infested, all of which came from human dwellings. The members of the United States Naval Medical Mission to Yemen consider that these figures show a definite need for a rat-trapping program in Yemen cities and for a further survey of the problem in Yemen.

Domestic rats are extremely common in Hodeida in the crowded city bazaar and in outlying buildings, storehouses, and dwellings. Nine of seventeen rats (53 per cent) were infected with the important flea *Xenopsylla cheopis,* and all of these were trapped in the bazaar. Although only thirteen fleas were taken on Hodeida rats, Lieutenant Colonel Traub's remarks about them are of con-

siderable interest: "These fleas and others from the same area are frequently occluded with blood. Similar conditions have been observed in fleas from plague areas and it is possible that these particular specimens were blocked with plague bacilli. It is hoped that this will be borne in mind if any further work is done in the area."

Plague has been reported as endemic in certain parts of Yemen, though not at Hodeida, and during the past summer received considerable newspaper publicity because of a supposed epidemic focus along the Yemen-Saudi Arabia border.

Ectoparasites.—Ticks: *Hyalomma* sp., *Rhipicephalus s. sanguineus* (Hodeida). Fleas: *Xenopsylla cheopis, Parapulex chephrinus* (Ta'izz); *Leptopsylla segnis, Xenopsylla cheopis* (San'a); *X. cheopis* (Kariet Wadi Dhahr; Hodeida). Mites: *Neotrombicula saperoi, Trombicula hoogstraali, Dermanyssus muris* (Ta'izz).

Mus musculus bactrianus Blyth

Mus bactrianus Blyth, 1846, Journ. Asiatic Soc. Bengal, **15**: 140—Kandahar, Afghanistan.

Specimens examined.—Total 24. Hodeida, 1 male, 1 female; Wadi Maleh (7 miles east of Ta'izz; 3,700 feet), 2 males; Ma'bar (7,400 feet), 1 male; San'a (7,100 feet), 10 males (3 alc.), 9 females (4 alc.).

Field notes.—As in many parts of Africa, the house mouse is both a domestic and a field inhabitant of the Yemen. The two Ta'izz specimens were taken at a termite mound in the acacia thicket bordering a seepage area in Wadi Maleh. The two Hodeida specimens were taken in the city bazaar and the first five San'a specimens were taken in a bazaar (Suq Babasaba) in that city. All other specimens from Ma'bar and from San'a were taken in dwellings.

I fail to understand why we obtained no house mice in Ta'izz and can only conclude that they are rare in that city. I cannot believe that none occur in Ta'izz. In Hodeida, boys brought us many additional specimens which we did not accept. In San'a, domestic mice are extremely common in all types of buildings.

It is noteworthy that these mice harbored a few immature *Rhipicephalus* and *Ornithodoros* ticks, but no fleas.

Ectoparasites.—Ticks: *Rhipicephalus s. simus, Ornithodoros* sp. (7 miles east of Ta'izz); *Rhipicephalus s. sanguineus* (Hodeida).

Acomys dimidiatus homericus Thomas

Acomys dimidiatus homericus Thomas, 1923, Ann. Mag. Nat. Hist., (9), **12**: 173—El Khaur, Aden District.

Specimens examined.—Total 9. Ta'izz area (1 to 5 miles north; 3,600–4,100 feet), 1 male (skull only), 5 females (1 skull only); El Hauban (4,000 feet; 5 miles east of Ta'izz), 1 male; Wadi Maleh (7 miles east of Ta'izz), 2 males (1 skull only).

These specimens agree in color with the description of *homericus*. The tails are not so long as described, being nearer the same length as the head and body instead of 10–20 mm. longer. Of three in alcohol one has a tail 15 mm. longer than head and body, and the tails of the others are about equal to the head and body length. Mr. Hoogstraal has reported that few specimens of *Acomys* have complete tails. He states (in letter): "The long skin tip beyond the end of the bone is often broken and grows back, though shorter than in uninjured specimens." The brain case is wider and the tooth row longer than in the type but as only measurements for the type were published, the extremes of size are not known to us.

Measurements (5 adults).—Total length 205–231 mm.; tail 102–113; hind foot 21–23; ear 20–22. Skull (1 male, 2 females): greatest length 31.8–33.6; condylo-basal length 28.5–30.9; interorbital width 5.2–5.5; zygomatic width 14.8–15.5; width of brain case across ridges 13.4–13.9; upper tooth row 4.8–5.2; length of palatal foramina 7.9–8.2.

Field notes.—Spiny mice apparently do not occur in human habitations in Yemen as they do in some parts of Africa. Around Ta'izz their favorite haunts are the rocks and the hard-packed, rocky soil in uncultivated lands. I doubt that they occur, or are at least common, in the Hodeida area. If they do live near sea level it is probably in specialized places not visited by us. We saw none on the Ma'bar plateau, and although we passed many places that appeared to be excellent trap sites for *Acomys* during our trips between San'a and Kariet Wadi Dhahr, we did not have an opportunity to investigate them.

The Ta'izz specimens were taken in the afternoon and at night in small burrows under euphorbia bushes on hillsides and ridges on which these shrubs were the principal plant. One was taken among rocks on a ledge above the "euphorbia-aloe hillside," and two specimens were trapped under bushes on this hillside. Two others were trapped on rock ledges of dikes, and three were taken around a termite mound in an acacia thicket beside a seepage area. Since

eight of these fourteen specimens were taken with snap traps, full ectoparasitic data cannot be gained from the list below, but it will be noted that as usual, *Acomys* harbors a number of fleas and immature ticks. It is interesting, however, that *Xenopsylla cheopis* was not among the fleas on these mice.

Ectoparasites.—Ticks: *Haemaphysalis leachi* subsp., *Rhipicephalus s. simus.* Fleas: *Xenopsylla* sp.?, *Parapulex chephrinus.*

Gerbillus cheesmani maritimus subsp. nov.

Type.—Chicago Natural History Museum no. 78045, from three miles southeast of Hodeida, sea level, Yemen. Adult female, skin and skull. Collected January 30, 1951, by Harry Hoogstraal. Original number HH 6307.

Description.—Darker than *cheesmani* and *c. arduus* and with longer tail. Upperparts near Sayal Brown; underparts pure white to roots; tail much lighter than back and with well-developed brownish tuft. Hind foot usually less than one third head and body length. Bullae larger than in *cheesmani* and *c. arduus.*

Measurements (type).—Total length 236 mm.; tail 135.0; hind foot 31.0; ear 13.5. Skull: greatest length 28.5; condylo-basal length 25.0; palatal length 14.5; interorbital width 5.0; zygomatic width about 14.5; width of brain case 11.7; upper tooth row 3.9; length of bullae 11.0.

Mr. R. W. Hayman, of the British Museum (Natural History), examined these gerbils and supplied the necessary comparative information for their description.

Specimens examined.—Total 10. Near Hodeida (3 and 5 miles southeast), 3 males, 7 females (inc. type).

Field notes.—All of these specimens were caught by hand at night while they were running among hummocks in the desert around Hodeida. Their characteristic burrow entrances were fairly common at the bases of scattered desert shrubs, but not so numerous as the large numbers of gerbils we saw by light at night might indicate. One female contained six embryos.

Because of their frequency on the much travelled and grazed desert around Hodeida, these heavily tick-infested gerbils must be considered as important hosts of the immature stages of tick genera of medical and veterinary importance.

Ectoparasites.—Ticks: *Hyalomma* sp., *Rhipicephalus* sp. Fleas: *Synosternus cleopatrae.*

Gerbillus (Dipodillus) famulus Yerbury and Thomas

Gerbillus (*"Hendecapleura"*) *famulus* Yerbury and Thomas, 1895, Proc. Zool. Soc. London, **1895**: 551—Lahej, near Aden, southern Arabia.

Specimens examined.—Total 12. Ma'bar: 3 males, 3 females; Ta'izz (east, west and north), 2 males, 4 females.

We are also indebted to Mr. Hayman for confirming our identification of this gerbil.

Field notes.—These gerbils were all taken at groups of several of the small, obviously connected burrows characteristic of this genus. Two males were taken side by side under a euphorbia bush on a euphorbia-covered hillside. Two lactating females were under different bushes of the same species but on a rocky ridge where the plants were sparse. The El Hauban female was taken under much the same situation as the other two. We have mentioned the profitable trapping at the termite mound in the Wadi Maleh acacia thicket at which the last female from the Ta'izz region was taken (see p. 240).

At Ma'bar we again were faced with the problem of the identity of the rodents inhabiting the hundreds of burrow entrances in ridges bordering cultivated fields and gardens. Although typical gerbil burrow entrances were much in evidence in these places around Ma'bar, we trapped only one gerbil at such a hole. The others were taken at larger holes in the same ridge, in a similar ridge bordering a fallow field, and at the mud wall surrounding the mayor's garden.

Unfortunately, by the time we reached Ma'bar our live traps had suffered so badly in transit over the rough roads that the Ma'bar gerbils were taken with snap traps, which may account for the absence of ectoparasites on them.

The absence of immature ticks on the Ta'izz gerbils as compared with the numbers on the Hodeida area gerbils is of some interest. The fleas, too, were less numerous, but at least one medically important species, *Xenopsylla cheopis*, is represented by a single specimen.

Ectoparasites.—Fleas: *Xenopsylla* sp., *X. cheopis* (5 to 7 miles east of Ta'izz).

Meriones rex buryi Thomas

Meriones buryi Thomas, 1902, Ann. Mag. Nat. Hist., (7), **10**: 488—Zabed, Haushabi, in hills north of Aden, 4,300 feet, southern Arabia.

Specimens examined.—Total 17. 6 miles south of Ma'bar (7,400 feet), 2 males, 3 females; 2 miles east of Ma'bar, 1 male; Al 'Asr

(3 miles west of San'a), 2 females (1 skull only); Kariet Wadi Dhahr (6,400 feet), 1 male, 1 female; 3 miles north of Ta'izz, 3 females; 5 miles north of Ta'izz, 1 female; 1 mile west of Ta'izz, 1 male; El Hauban (in Wadi Maleh, 5–7 miles east of Ta'izz; 3,900 feet), 1 male, 1 female.

The series from Ta'izz is a very dark brown, while those from San'a and Ma'bar are buffy gray. Mr. Hayman, who compared four of these with material in the British Museum (Natural History), reported that "No. 77954 is an almost exact match of the type of *buryi* in every respect." They are all darker than *M. rex rex.*

Field notes.—As the further discussion of this ubiquitous upland jird will show, its habits in the Yemen were a source of confusion when an attempt was made to define the conditions under which it lives and the signs that indicate its presence in the field and differentiate it from other rodents. Some of this confusion was due to the great range of coloration and pelage pattern, which characters, in addition to the burrowing habits, led me to believe that I was handling two or even three "forms" of rodents.

We took no *Psammomys* in the Yemen but I suspect that *Psammomys* had originally made many of the burrows now inhabited by *Meriones.* Large, clustered *Psammomys*-like holes were found in cultivated areas and less commonly under euphorbia bushes and thorn trees on uncultivated hillsides and ridges. If it is true that *Meriones* constructed all these burrows, then the burrowing habits of the *Meriones* in the Yemen mountains differ from those of its Egyptian desert relatives, whose burrows are smaller and scattered individually.

The jird is the most common rodent in the cultivated and uncultivated areas of the Yemen mountains, and it lives under a considerable variety of conditions. Everywhere along the raised earthen ridges bordering fields and ditches one sees dozens or hundreds of its burrow entrances. On flat fields large colonies frequently do considerable damage, especially when they live in "towns" like those of prairie dogs, numerous holes opening into a circular area often five to ten yards in diameter. On numerous occasions we broke through the soft shell of ground into tunnels that honeycombed flat fields as we walked over them.

We saw jirds dashing about at any hour of the day. The fine Yemen soil is so hard-packed that holes and burrows are probably preserved for many years, and it was quite a problem to determine

which few of the many hundreds of holes in any one area might actually lead to an inhabited nest. The percentage take for the number of traps we set in apparently excellent places in cultivated fields was very low, leading me to believe that many of these burrows may be only visited or temporarily inhabited, although the scratch marks, footprints, discarded soil, and fecal pellets indicate that the burrow is inhabited.

The first three specimens near Ta'izz were trapped about four o'clock in the afternoon, less than an hour after the traps were set, under euphorbia bushes on a hillside rather densely overgrown by these plants. The multiplicity of entrances around the bushes here was in my opinion *Psammomys*-like. The next specimen was taken under a shrub on a hillside about three hundred feet lower in elevation (3,700 feet) than the others and with a much more varied herb and shrub fauna than we saw on other hillsides in the Ta'izz area. This hill we termed the "euphorbia-aloe hill." The jird came from a single hole, which I considered typical for this genus. The Mocha ridge specimen was taken at a "*Psammomys*-type" complex of burrows under a euphorbia bush in a place where these shrubs were widely scattered on rocky ground. While trapping on a rocky dike in a cultivated field, a place normally inhabited by *Acomys* and possibly by hyraxes, we quite unexpectedly obtained another specimen. The last individual from the Ta'izz area was trapped in a dense thicket beside a marshy seepage area. This thicket was rich with runways and various kinds of rodent holes from which *Arvicanthis*, *Gerbillus*, and *Mus* were trapped. The single *Meriones* was taken at a "*Meriones*-type" opening at the base of a large termite mound in the thicket. One or several of each of the other rodents mentioned were taken in a radius of a foot or two from this spot. Our many traps at likely-looking spots in cultivated fields in the Ta'izz area failed to secure individuals of this species.

Near Ma'bar we succeeded in capturing five specimens whose burrows opened into a dirt ridge surrounding a fallow field at a point near a deep well. Literally hundreds of holes opened into this ridge for a length of some two hundred feet, and both *Meriones* and *Gerbillus* (*Dipodillus*) *famulus* were taken from them. The other Ma'bar specimen was taken from a burrow under the wall in the mayor's garden at the edge of the city.

In the San'a area, two females were flooded out of contiguous burrows opening into a dirt ridge surrounding a sparse pasturage field at Al 'Asr, and a male and female were trapped on runways

under a thorn tree and under an acacia tree in the King's garden in the fertile Wadi Dhahr.

A specimen that came from a hillside with a richer and more varied flora than we had an opportunity to collect in elsewhere, which we termed the "euphorbia-aloe hill," was heavily infested with fleas and ticks. I suspect that this parasitic condition may prevail throughout much of the luxuriant foothill area above the coastal desert, up to about 4,000 feet. We were unfortunately almost totally unable to touch this belt, the richest floral and faunal area of the Yemen. The fauna of the Ta'izz area represents about the upper limit of this lower middle altitude belt.

The rather few ectoparasites removed from these seventeen specimens lead me to believe that they must harbor a large nest-inhabiting fauna, for I cannot believe that rodents living as these do are so lightly parasitized. The proof of this assumption, of course, awaits further investigation. There are, however, just enough ectoparasites of important genera and species represented in this small series to indicate that the medical potential of this common rodent should be further investigated. The susceptibility of some species of this genus to virus and rickettsial infections causes this Yemen representative to be particularly suspect as a natural host of these diseases.

Ectoparasites.—Ticks: *Rhipicephalus s. simus* (5 miles north of Ta'izz); *Ixodes* sp. nov. (Ma'bar). Fleas: *Parapulex chephrinus, Xenopsylla,* 2 spp. (Ta'izz); *X. cheopis* (Ma'bar). Mites: *Neoschongastia yemenensis, Haemolaelaps namrui* (Ta'izz).

Gazella gazella arabica Hemprich and Ehrenberg

Antilope arabica Hemprich and Ehrenberg, 1827, Darstellung Säugeth., pl. vi and text—Farsan Island, on Arabian coast of Red Sea.

Specimens examined.—Total 5. Ta'izz (4,100 feet), 1 female; El Hauban (in Wadi Maleh, 5 miles east of Ta'izz; 3,900 feet), 1 male; Usaifira (4,000 feet), 1 immature female; Jebel Zarba (near Ta'izz; 7,000 feet), 2 females.

The color of these gazelles is dorsally near Bone Brown, the neck near Snuff Brown lightening on shoulders and continuing to flanks as a broad light stripe between the dorsal color and the side stripe. This stripe and the buttocks stripe are Mouse Gray or darker and divided from the white of the underparts by a narrow reddish brown line.

Measurements (skull, adult male; 3 females in parentheses).—Condylo-basal length 191.0 mm. (179.0–186.0); greatest breadth 87.0 (75.0–81.6); nasals, length 44.2 (47.0–51.6), width 26.8 (22.7–22.9); distance across horn cores 70.3 (55.6–57.9); longest horn, straight line 255.0 (138.0–150.0); upper tooth row 62.6 (61.2–62.6).

Field notes.—Gazelles are very common in the hills around Ta'izz, but except for the immature specimen taken in a thicket in the King's garden and orchard at Usaifira, a few miles from Ta'izz, we saw none in cultivated fields or in sight of roads or trails in that region. Instead they were found alone or in company with one or two others on the euphorbia-covered slopes separated by hills from cultivated areas. In the last three or four years at least, gazelles have been rather constantly hunted for food by officers and the Royal Guards of Ta'izz, according to information supplied us. Judging from the ease with which specimens could be obtained away from cultivation it would appear that the hunting has not made serious inroads into the local supply of gazelles, but it has made them wary of places frequented by humans. As noted (p. 251), we frequently saw gazelles in cultivated areas in other parts of the Yemen.

The moderately heavy infestation of these gazelles by the common dog tick is of interest.

Ectoparasites.—Ticks: *Amblyomma* sp. (probably *variegatum*), *Rhipicephalus s. sanguineus.*

Gazella dorcas saudiya Carruthers and Schwarz

Gazella gazella saudiya Carruthers and Schwarz, 1935, Proc. Zool. Soc. London, 1935: 155—Dhalm, about 150 miles northeast of Mecca, Arabia.

Specimens examined.—Total 2. Ma'bar (4 miles south; 7,400 feet), 2 females (1 juv.).

This specimen is referred to this species though the horns are much shorter. The dorsal color of the adult is Snuff Brown, which becomes lighter on the sides to divide the dorsal color from the dark side stripe. The juvenile, offspring of the adult specimen, is Smoke Gray darkened by black tips to the hairs. The side stripe and other adult markings are present.

The skull differs from that of *arabica* in the longer nasals, which overlap the premaxillaries. The horns are short as described for the species (144 mm. against 200–250).

Measurements.—Condylo-basal length 175.0 mm.; greatest breadth 73.9; nasals, length 55.0, width 18.6; width across horn cores 50.4; longest horn, straight line 144.0; upper tooth row 50.4.

Field notes.—The adult female was shot by a Yemeni in a field about half a mile from the town of Ma'bar, and the fawn was brought in alive. We saw herds of five to eight gazelles in the immediate vicinity of Ma'bar and farther afield on the barren Ma'bar plain at almost any time of the day, but never at night. We frequently remarked on the less conspicuous flank bands of these specimens in contrast to the Ta'izz gazelles and to others that we saw at different elevations on the trip from sea level (Hodeida) to Ma'bar. On this trip, we saw numerous herds of four to twelve gazelles feeding in cultivated fields at various altitudes. Some gazelles showed the conspicuous flank band and others did not, but we failed to correlate these observations with altitude. We saw no signs of gazelles in the San'a area and were told that there were none within a day's trip from the city. In the desert around Hodeida we had a momentary glimpse of one large gazelle at night and of another single specimen in the distance at dusk.

Procavia capensis jayakari Thomas

Procavia syriaca jayakari Thomas, 1892, Proc. Zool. Soc. London, **1892:** 63; **1894:** 455; **1900:** 104—Dofar, southern Arabia.

Specimens examined.—Total 5. Ta'izz area: Jebel Zarba (6,000–7,000 feet), 1 male, 1 female; Jebel Halil Salma (west of Ta'izz; 6,000 feet), 2 females (1 immature); Daha El Nokhayib, 1 female.

The adult female from Jebel Halil Salma is light brown, more reddish on the rump, and the underparts are buffy white. All the other skins are in general color a uniform dark gray, the underparts being a lighter gray. In all the small dorsal spot is buff.

Measurements (adult male and female).—Total length 440 mm., 477 mm.; hind foot 66, 67; ear 33, 38. Skull: greatest length 85.0, 87.0 mm.; condylo-basal length 82.3, 85.9; palatal length 43.5, 43.2; interorbital width 24.2, 21.0; intertemporal width 24.6, 24.7; zygomatic width 49.9, 47.2; width of brain case 31.6, 31.0; upper tooth row 34.9, 33.6; length of nasals 22.0, 22.5.

Field notes.—The hyrax was common among rocky ledges and undercuts of the euphorbia-covered mountain sides encircling Ta'izz. None was noticed near cultivation but on steep slopes individuals could frequently be seen sunning themselves or running along the side of the slope. A careful study of the blood of these specimens

was made in the hope of finding protozoan parasites, but none was found. At Bajil we were told that hyraxes were very common around all the low hills near the town. These may represent a separate lowland subspecies. Repeated questioning about hyraxes in the San'a area always resulted in the information that they could not be found in less than two days' journey from the city.

Ectoparasites.—Fleas: *Ctenocephalides ?arabicus, Parapulex chephrinus.*

REFERENCES

ALLEN, G. M.
1939. A checklist of African mammals. Bull. Mus. Comp. Zool., 83: 1–763.

CABRERA, ANGEL
1925. Genera Mammalium, Insectivora, Galeopithecia. Madrid. 232 pp., 18 pls.

ELLERMAN, J. R. and MORRISON-SCOTT, T. C. S.
1951. Checklist of Palaearctic and Indian mammals. 810 pp.

MILLER, GERRIT S., JR.
1912. Catalogue of the mammals of western Europe. British Museum (Natural History). xv+1019 pp.

MOUNT, R. A.
1953. Medical mission to the Yemen, southwest Arabia, 1951. Amer. Jour. Trop. Med. Hyg., 2, (1), pp. 1–12.

OGNEV, S. I.
1927. A synopsis of Russian bats. Jour. Mamm., 8: 140–157.